

Wildlife Food Plantings

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Forestry and Natural Resources

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There are 3 ways that landowners, managers and sportsmen can improve the quality and availability of wildlife foods. One method includes protecting existing high value native wildlife food plants that already exist. Secondly, managers can enhance and stimulate the growth of native vegetation by mechanical (timber thinning, strip disking, mowing, prescribed burning) and chemical (herbicides, fertilizers and lime) means. A third way is to propagate desired wildlife food plants by direct seeding or seedling planting, which is often called supplemental planting with food plots. Land management plans that list wildlife as an objective should have all 3 wildlife food enhancement methods included. This provides a diversity of quality foods year round. Planting and cultivation of food plots is the most popular wildlife management technique conducted by sportsmen, managers and landowners on private lands in the Southeast. This is probably because the results of their efforts are usually visible and tangible in a relatively short period of time. Plants grow rapidly and wildlife readily use food plots. Since the quantity, quality and distribution of native wildlife foods are often subject to seasonal and yearly fluctuations, cultivated plantings can supplement native food supplies in many cases. On poor sites with low fertility, where native plants are lacking in nutritional value, food plots can have a positive effect on wildlife. In addition, food plots can be used to attract and concentrate animals to facilitate viewing, photography and harvesting of game animals.

Supplemental plantings should not be viewed as a substitute for protecting and enhancing native wildlife foods. Native foods should be inventoried, evaluated, and managed **before** making substantial investments in wildlife food plantings. **In most cases, managing existing native wildlife plants constitutes a more practical and cost-effective method of enhancing wildlife habitat.**

Categories of Wildlife Food Plants

Wildlife plants in the South can generally be classified as grasses, legumes, annuals, perennials, warm-season or cool-season plants, woody vines, shrubs, and trees. Grasses are herbaceous (non-woody) plants that have parallel leaf veins and grow fibrous root systems. Grasses should not be confused with wetland plants, such as sedges or rushes, which are not true grasses. Legumes are herbaceous plants which form a pod containing seeds, have netted leaf veins, and usually have a well-developed taproot system. Legumes have the unique ability to produce their own nitrogen, often called "free nitrogen," with the



aid of a bacteria of the *Rhizobium* genus that attaches to root nodules (joints). Because of the ability to produce nitrogen, legumes usually do not require nitrogen fertilizers during food plot establishment. To ensure that legumes get the nitrogen-fixing bacteria they need, seeds of legumes should be mixed in with bacteria (inoculated) before planting or they can be purchased pre-coated with a bacteria inoculant.

Some wildlife food plants are annuals since they germinate, grow, reproduce and die in one year. Annuals grow only from seeds and must be established each year by planting. Perennials, on the other hand, live for more than one year and can grow from seeds or reproduce from vegetative parts of the plant. Perennials do require some maintenance, such as annual mowing, disking, fertilizing and liming. Some wildlife plants are also considered biennials in that they usually survive at least 2 growing seasons.

Landowners and wildlife managers interested in establishing wildlife plantings usually do so during 2 periods of the year: in the spring or early summer, or in the fall. Plants that are normally seeded or begin growth in spring or early summer and grow during these times are

considered warm season plants. Plants that are primarily seeded or begin growing in the fall are classified as cool season plants.

Wildlife biologists and ecologists are beginning to make an additional distinction between plants considered to be native (naturally occurring) and those that are exotic (nonnative) plants. From an ecological standpoint, more emphasis is being placed on recommending native plants that are better adapted to local site conditions and in many cases are less likely to be noxious (invasive and overly competitive with native plants) than exotic plantings. Plants, whether natives or exotics, that could spread as noxious weeds, should be avoided in wildlife plantings. As an example of a noxious exotic plant, consider the profound effects of kudzu in the South. Kudzu, an Asian import, was utilized initially for erosion control by USDA Soil Conservation Service (currently the Natural Resource Conservation Service) personnel for plantings along steep banks adjacent to newly-constructed roads. No one dreamed what a nightmare it would become once established. Like the dreaded contents of Pandora's box, no one chooses to let kudzu "out" any more.

Nutritional Needs of Wildlife

Understanding wildlife nutritional requirements is an important aspect in planning wildlife plantings. With proper planning, they will provide the maximum value to select wildlife. Wildlife with an adequate supply of quality food will grow larger as a general rule. They also produce more young, look more vigorous and healthy, make better trophies, and are more resistant to diseases or mortality than animals affected by malnutrition. The lack of quality food can be a major limiting factor for wildlife, affecting growth, reproduction, and survival.

Quality wildlife foods generally contain adequate amounts of nutrients. Some of the nutrients are protein for body growth, development and maintenance; carbohydrates as a source of quick energy; lipids or fats as a main ingredient in physiological processes and a source of stored energy; vitamins for maintaining growth and vigor; and an assortment of minerals that are needed for bone and tooth formation and maintenance of body functions. Of these nutrients, protein is considered the most essential to wildlife and is often found lacking in native plants. In fact, some scientists consider protein to be the most important factor limiting growth and reproduction of white-tailed deer. Crude protein content (a measure of protein) in native wildlife plants usually ranges from a low of 2.4 percent to a high of 38.7 percent; however, most native forages rarely reach levels above 10 percent. Plant protein is concentrated in the growing tips of stems, and in seeds such as beans, grains and nuts. Legumes, because of their ability to produce nitrogen with root bacteria, are generally excellent sources of protein. Some wildlife species, like white-tailed deer, require 16 to 17 percent protein levels in their diets for body maintenance, and levels of 17 percent and above for optimum antler development. Phosphorus, and to a lesser degree calcium, are also important nutrients in antler development of deer. Unfortunately, on most soils in the Southeast, phosphorus is lacking and consequently is not readily available to deer in native forages.

Studies have shown that nutrient levels in plants in the Southeast are at their highest level and are more readily digestible to wildlife during the spring or fall growing seasons. Plant nutrient levels drastically decline in late summer and winter months and become less available to wildlife. During these times, digestibility of plants is reduced due to the low moisture content and increased fiber content. Therefore, it is not surprising that the decline in plant quality corresponds, in general, to the nutritional stress periods of late summer and winter for some wildlife species in the Southeast. Efforts to supplement wildlife diets with plantings should be directed toward these periods of the year when native vegetation is at its lowest nutritional level.

Wildlife Planting Considerations

Careful planning can mean the difference between success and failure of wildlife food plots. Many factors should be considered when planning food plots, including:

- Choosing the right plant,
- Site selection,
- Size, shape and distribution of food plots,
- Land preparation,
- Planting dates,
- Seeding rates,
- Fertilization and liming,
- Inoculation of legumes,
- Companion plant(s),
- Planting seedlings,
- Maintenance and management,
- Cost and availability of plant materials,
- Weed and insect control, depredation, and
- Record keeping.

These factors will be discussed in the following sections.

Choosing the Right Plant

Matching the right plant(s) to wildlife that you are interested in attracting and maintaining is not an easy task. No single plant will grow in every soil and climate and provide all the nutritional needs of wildlife. For example, there are over 62 different types of plants used in food plots for deer in the Southeast. In reality, wildlife will readily use a variety of plants for food and cover; however, preferences do exist for certain plants. These preferences depend on the quality and availability of native foods and agricultural crops in the area, and seasonal physiological demands on wildlife, such as gestation, lactation, and antler development. In addition, some wildlife are better able to utilize certain plants.

Some food plots fail because the plants are not adapted to the site. Plant adaptation is limited by soil type, climate and drainage. Care should be taken to select wildlife plants that are adapted to the climate of your area. For example, some plants are more cold tolerant than others and will persist longer during the winter months or will have a better

chance of survival in regions where the average winter temperature is well below other areas. On the other hand, some plant species are sensitive to prolonged high temperatures and will die out in extreme heat. Obviously, the further north you go the more you should consider cold-tolerant plants. For example, rye or ryegrass is more cold tolerant than oats and therefore would have a better chance of survival in the upstate of South Carolina than would oats.

In many cases, there are also knowledgeable land managers or natural resource professionals who have experience and successes with plantings for wildlife in your area. Seek them out and ask their advice.

As a final thought, experiment with different plants, mixtures and seeding rates to see what works best for you on your land. One of the best ways to see how much your field is being used by wildlife, especially deer, is to place a wire fence enclosure in the food plot. An **exclosure** is simply a small fenced in area, usually 4 to 5 square feet in size, that protects plants inside the enclosure from being eaten by wildlife. Exclosures can be easily constructed with any type of woven mesh fence material that is held in place by fence posts. The height and vigor of plants inside the enclosure can easily be compared to plants outside the enclosure for an indication of food plot use. After experimenting with several plant varieties and planting styles and recording the results of growth and use by wildlife, you should have a pretty good indication of the most desirable plants for your area.

Site Selection

To ensure successful wildlife plantings, the plant should be well adapted to the soil type of the site chosen for a food plot. For example, some plants are better adapted to moist or wet sites, while others prefer well-drained areas. If you are unsure of the soil types on your land, you should obtain a copy of your county's soil survey, which can be obtained free of charge from your local county Natural Resource Conservation Service office. These surveys, if available in your county, are an invaluable tool that contain a county soils map on which you can easily identify your property and the prevalent soil types that occur on your land. Soil surveys also have a handy listing of native and propagated plant species that are adapted to each soil type. In addition, observing wildlife food plantings on similar soil types within the same area can also be helpful in selecting plants that might grow well on your property and be readily utilized by wildlife.

Landowners should avoid wildlife plantings on sites that are considered wetlands to avoid possible violation of the USDA Swampbuster Program or the Clean Water Act. Before establishing food plots in wetland areas, you should contact your local Natural Resource Conservation Service office for guidance.

Excellent locations for wildlife plantings include unused corners and edges of agricultural fields, forest openings, forest regeneration areas, idle crop fields and meadows, adjacent to fence rows, ditch banks, utility rights of way and access roads, logging roads, edges of wide woods roads, logging decks, forest salvage openings, firelanes, abandoned fields, or any other area where enough sunlight reaches the ground.

Some wildlife managers have established food plots in strips in thinned pine stands where the basal area has been reduced to 60 square feet or less.

Food plots can be most effective when located along transition zones where several habitat types meet. Food plots adjacent to streamside management zones, travel corridors and escape cover are also good locations. For many wildlife species, like bobwhite quail, locating plantings adjacent to escape cover is extremely important in reducing predation. As an added protective measure, to reduce unwanted predation of small game by raptors (such as hawks and owls), tree snags and other likely perches adjacent to food plots should be removed if at all possible. Consideration should also be given to alternating locations of small game food plots to prevent possible accumulation of predators from repeated food plot use by small game. To discourage illegal harvest of larger game animals, such as deer and turkey, wildlife plantings should not be located in view of, or be accessible by, a public road or right of way. Food plots in plain view of access roads can quickly become drive by or roadside shooting plots for wildlife poachers. To prevent viewing from access roads, some managers plant rows of trees or shrubs to reduce the visibility of food plots. Examples of good screening tree choices include pine, eastern redcedar, leyland cypress, and autumn olive.

Location of food plots should be included in forest management plans and determined in advance of harvest layouts and timber sales. Permanent openings on forest land should be easily accessible for food plot cultivation, especially if large mobile contract lime and fertilizer spreaders are to be utilized.

To prevent soil erosion from cultivation activities, food plots should be established on level to near-level ground. If food plots are located on sloping terrain, they should be maintained as natural openings by periodic low-intensity disturbances such as prescribed burning, light disking or mowing. If unlevel openings are planted as food plots, they should be seeded in biennial or perennial plants that require little maintenance and infrequent soil disturbance. This will help reduce soil erosion and provide another variation in the type of food plots available to wildlife.

Size, Shape and Distribution of Plantings

Size, shape and distribution of wildlife food plots are important considerations when trying to maximize their effect. Size of plantings determines the degree to which food plots will be used. Large food plots may not be fully utilized by some species, while smaller plots may be over-utilized and exhausted in a short time. As a general rule, smaller or less mobile species of wildlife require a proportionally smaller food plot, and will benefit from a greater number of plantings per unit area. For example, food plots for quail may be as small as $\frac{1}{8}$ to $\frac{1}{4}$ acre in size. Plantings for quail should be made adjacent to escape cover so that quail food plots don't become food plots for predators. Plantings for deer and turkeys should range from 1 to 5 acres. Most plantings for dove and waterfowl should be at least 5 acres in size and preferably over 10 acres.

Wildlife like deer and turkeys are reluctant to use the center sections of large plots, especially where regular disturbance or hunting is commonplace. Over time deer will eventually begin feeding in the center of large plots, but only at night. To ensure that wildlife have easy access and use of food plots, plantings should be long and irregular in shape. Large evensided plantings should be avoided. Vegetative hedgerows can be established through the interior of large openings to provide additional cover.

Wildlife plantings should be evenly distributed across an entire tract of land to ensure access by wildlife. As a general rule, depending on the availability and quality of native wildlife food plants, wildlife plantings should comprise approximately 1 to 5 percent of the total forest land. One plot per 25 acres of forest land is a good ratio of food plots to forest land for deer and turkey.

Land Preparation

Preparing the land before planting is vital in securing a successful stand for most wildlife foods. Proper seedbed preparation enhances the formation of a firm, moist, level seedbed, which is necessary for a successful wildlife planting. A well-pulverized, level seedbed helps maintain a consistent seeding depth that is important for seed germination. This is especially important for small-seeded legumes like many of the clovers, where seed can be wasted if planted too deep. To determine if a seedbed has been properly prepared, walk over your field. If your shoe prints are not much deeper than the sole of your shoe, your preparation is sufficient. If your foot sinks too deep, you should use a cultipacker (a tractor attachment used to compact freshly plowed land) to pack the dirt tighter in the seedbed.

When converting logging decks and logging roads to wildlife food plots, soil compaction, also called a hardpan, may be a problem. Hardpans are created by weight and pressure from heavy equipment which compresses the soil so that soil pore space (the very small, natural air spaces between soil particles) is reduced. Even the steady traffic of livestock can cause a shallow hardpan. Water and oxygen do not travel well through hardpans or compacted soil, and during periods of low rainfall wildlife plants are doomed to failure. Even with adequate rainfall, water will lie in puddles on the surface of the compacted soil and evaporate before it can seep down to the roots and be utilized by plants.

To detect a hardpan, use a push probe, a 2- to 2½-foot metal rod with one end sharpened to penetrate through the soil and the other end with a handle to push the probe through the soil. Push probes can be made or purchased from a forestry equipment supplier. Check for hardpans when the soil is fairly dry (dry enough to operate farm equipment on the site), but not extremely wet or dry. Insert the probe 2 to 3 times at various locations across the field. Areas that appear to have little or no surface vegetation could indicate a hardpan. As the probe is inserted, the force required to move it through the soil should remain about the same until a hardpan is reached. At the point of a hardpan, it takes a significantly greater amount of effort to push the probe. When the probe reaches

a hardpan, note the spot on the probe to determine the depth of the hardpan. A hardpan may range from 2 to 10 inches thick.

Hardpans detected within the top 6 or more inches of the soil should be broken apart by subsoiling. Subsoiling (breaking up the soil to depths of 6 to 12 inches) will fragment compacted soil. To subsoil, a landowner needs a tractor, dozer or skidder that has at least a 50 horsepower engine. A chisel plow should be used to break up the hardpan to a depth of 6 or more inches below the soil surface. Sites which are to be established as wildlife food plots and have an obvious hardpan should be subsoiled 30 to 60 days before planting to allow the soil to settle and establish a firm seedbed.

Logging decks and logging roads converted to food plots should be subsoiled to reduce compaction. Subsoiling is also recommended every 2 or 3 years on all food plot sites. Subsoiling breaks apart hard subsurface soil which can reduce water availability and root growth of plants.

Seedbed preparation, like subsoiling, should ideally begin several months, and at the very latest several weeks, before planting. Early seedbed preparation allows time to incorporate lime (if needed) to stabilize soil pH well before planting. Advance seedbed establishment also helps to reduce unwanted weed competition. In fact, if time permits, weed competition can be greatly reduced if the seedbed can be cultivated (mixed and then leveled by mechanical means) at one week intervals 3 to 5 times before planting. This will improve the quality of the plot significantly.

Planting Dates

Timing of plantings is critical for successful wildlife food plantings. For example, many wildlife food plants have differing optimum planting times that are often only a few weeks in length. Scheduling planting during the range of best planting dates often means the difference between a successful food plot and one that is doomed to failure. It seems almost inevitable that bad weather, mechanical failure, and a multitude of other factors delay plantings. With this in mind, wildlife food plots should be planted as early as possible within the recommended period. Late planting of warm season wildlife food plots, that are normally planted in the spring may result in increased weed competition. It may also make the planting more susceptible to summer drought because the root system is not fully developed. In comparison, planting a cool season wildlife plant too late in the fall may result in cold-induced stress and ultimately cause a complete planting failure.

Staggering two or three plantings of the same plant within the “safe” planting dates can increase the availability of food for wildlife. For example, a wildlife opening that is divided into three smaller fields, with each subfield planted two weeks apart, can extend the length of available food for one month. Caution should be used in staggering planting dates for more than three different time periods since there is the risk of low germination and poor growth. There is no need to stray too far from the optimum planting dates.

Seeding Rates

If seeding rates are too low, weed competition and germination problems can cause a wildlife food plot to fail. On the other hand, extremely heavy seeding rates can be a waste of money. As a rule of thumb, seeding rates for establishing wildlife food plots should be higher than the rates recommended for commercial production of the same plant. Higher seeding rates help to ensure that a significant portion of the seeds germinate. Since seed costs are usually not a major expense in the overall costs of food plot establishment, many wildlife managers routinely exceed the recommended seeding rate to ensure a successful wildlife planting. There are exceptions to this, such as the cost of some seed like clover, for example. Wildlife plants can be seeded with a variety of methods including those used to establish agricultural crops. These methods include 1) cyclone or spin seeders operated from either a tractor power takeoff, batteries or by hand; 2) band seeders; 3) cultipacker seeders; 4) drills; and 5) broadcasting by hand. Large-seeded plants like grains and vetches should be seeded with a drill. Small-seeded plants can be drilled if they are not planted too deeply.

Broadcasting seeds can also be effective for small-seeded plants like clovers if a cultipacker is used afterwards to ensure that seeds are in good contact with the soil. Seeding rates vary somewhat depending on the method of planting. For example, with drill seeding the planting rate is somewhat lower than when broadcasting seeds, since planting depth and spacing is more precise when seeds are drilled. In addition, seed lost by broadcasting is greater since wildlife readily feed on exposed seed.

Fertilization and Liming

Very few food plot sites in the Southeast naturally contain the proper amount of nutrients for successful food plot establishment and growth. Most often food plots are initially planted on “new ground” (logging decks, logging roads, forest openings). These areas have not been in cultivation for some time, and consequently lack adequate amounts of soil nutrients necessary to establish or maintain a wildlife planting. Except on some agricultural lands, most areas chosen for food plots contain low levels of plant nutrients and acidic soils that are not conducive to growing wildlife food plots. The nutritional quality of plants and their value to wildlife is directly related to the fertility (abundance of nutrients) of the soil in which the plant grows. Numerous studies have demonstrated the positive relationship of soil fertility to the size of animals, reproductive success, and abundance. Deer and turkey prefer forage that has been properly limed and fertilized and usually eat it first, since it is more palatable and nutritious than unfertilized vegetation.

Nutrient deficiencies in the soil can be corrected by applying the proper rates of fertilizers and lime. The only way to really know how much fertilizer and lime to apply is to have the soil tested. Soil tests should be made several months before planting to allow enough time to receive test results and then apply lime before planting. Tests will determine the nutrient needs of a site for a particular planting, as well as help contain costs associated with over-fertilization and liming. In some cases

over-fertilization and liming can reduce plant growth. Fertilization and liming rates should be based, if possible, on soil test results. Information and help on how to collect soil samples, analyzing soil samples, and interpreting soil test results can be obtained from the local county Cooperative Extension Service office. Based upon the results of your soil test, a local farm supply store or co-op will be able to prepare a fertilizer tailored to a particular field's needs.

Fertilizers are sold in many ways, but generally in ratios that express the percentage of nitrogen (N), phosphorus (P) or phosphate (P_2O_5), and potassium (K) or potash (K_2O). For example, with triple 20 (20-20-20) fertilizer, the ratio means that for every 100 pounds of fertilizer there are 20 pounds of nitrogen, 20 pounds of phosphorus, and 20 pounds of potassium. Fertilizers with all three nutrients are called “complete” fertilizers. However, if soil tests reveal that only one nutrient is needed, it can be purchased and applied separately.

Soil tests will also determine the pH, which is an indication of the degree of acidity or alkalinity of a soil. This is important in food plot establishment. A pH value of 7 is considered neutral while a pH below this value is acidic. A pH above 7 is alkaline. Most wildlife food plants do best between a pH of 5.8 and 6.5. Soil nutrients are more readily available to plants in this pH range. In addition to determining the pH of a food plot site, soil tests also provide a recommended rate of lime for raising the pH level if the soil is too acidic. Lime should be applied during land preparation and mixed with the soil several months before planting to allow time for the soil pH to change. Since recommended application rates of lime usually run around 1 to 2 tons per acre for acidic soils, lime application is usually done using a commercial spreader or liming truck provided by the dealer or farm supply store. It is wise to make sure that food plots are accessible by lime spreaders and trucks. If not, you may find yourself spreading lime from the back of a pickup truck, which is less effective and much more tiresome.

Inoculation of Legumes

Seeds of legumes should be treated with the proper mixture of live *Rhizobium* bacteria before planting. *Rhizobium* is the scientific name of a bacteria that facilitates nitrogen fixation (production of nitrogen) and allows nitrogen to become available for plant growth. The technique of mixing bacteria with legume seeds is called inoculation. Some commercial varieties of legume mixtures that are marketed especially for wildlife plantings have bacteria already added, like red clover, birdsfoot trefoil and white clover. However, for those legume seeds that are not inoculated, you can add *Rhizobium* bacteria with bags of inoculant purchased from your local farm supply store. Directions for mixing the seed with the inoculant are found on the bag. When purchasing a legume inoculant, be sure that you specify the legume that you wish to inoculate, since certain bacteria are specific for certain legumes. Inoculated seed should be protected from high heat or direct sunlight, since this tends to kill the bacteria and consequently reduces the effectiveness of inoculation. In addition, you should never directly mix fertilizers with inoculated seed, since the salts in fertilizers kill bacteria.

Companion Plants

Plant mixtures are usually more desirable as wildlife plantings. Combination plantings not only provide a diverse food source for wildlife, but also lengthen the availability of food. For example, the availability of a wheat-ryegrass mixture will be longer than that of a field of wheat alone. Over-seeding winter annuals like wheat and rye on dormant sods of warm season plants like bahiagrass, bluestems, or dallisgrass is also an excellent way to extend the length of time that a planting is available to wildlife.

For deer and turkey, combination plantings can be used to produce abundant quality forages during all seasons, especially during the late autumn-winter stress period. Some of the most popular mixtures include wheat and clover combinations and rye and white clover mixtures. Small grain and clover mixtures are the best combinations for deer and turkey, providing forage from fall through early spring.

A mixture of clover and joint vetch can provide high-quality forage from spring to early fall. Mixtures of wheat, oats, and elbon rye are also popular. Ryegrass and arrowleaf clover make good fall and spring combinations and can be maintained by mowing and fertilizing each September. If clover mixtures are desired, blends of ladino, red, and annual clovers might be mixed to derive advantages of each clover type. A combination of plantings can be chosen that supplies quality forage during critical periods year round.

When planting mixtures, use $\frac{1}{2}$ to $\frac{2}{3}$ as much seed of each plant species as you would use if you planted just one species.

Planting Bareroot Tree and Shrub Seedlings

Bareroot seedlings are used most often in establishing wildlife shrub or tree plantings. Bareroot seedlings are seedlings grown in a nursery bed, lifted after one or two growing seasons and shipped and planted without any soil around the roots. This is in contrast to seedlings that are potted in soil or balled with burlap. The roots of bareroot seedlings are usually packed with some type of medium to keep them moist during shipping and until planting. This medium may be shredded newspapers, sphagnum moss or sawdust. The roots may also be dipped in a gel medium that clings to the roots and keeps them moist. Bareroot seedlings are less expensive than potted or balled plants because less labor is required for growing them in the nursery. They also weigh less and therefore are cheaper to ship.

Care of seedlings before planting is important in order to ensure survival. Poor care before planting is one of the main causes of low survival. Seedling roots should be kept moist at all times in a storage area with 85 to 95 percent humidity. Seedlings should be stored in a refrigerated unit at a temperature between 33 and 38 degrees F. If no refrigeration is available, seedlings can be stored at 38 to 50 degrees F. for 2 to 3 weeks, or at 50 to 75 degrees F. for 3 to 5 days. Temperatures above 85 degrees F. will quickly kill stored seedlings.

Bareroot seedlings can be planted with a planting bar (often called a dibble), shovel or mattock. Care of seedlings during planting is critical

for survival. Seedling roots must be kept moist before planting. Ten minutes of air drying on a warm, sunny, windy day can reduce seedling survival by as much as 50 percent. To prevent damage to the roots, only carry as many seedlings as you can plant in ten minutes. Keep the remaining seedlings in the shade, with the roots moist and covered.

Seedlings should be planted just slightly deeper than the depth they were planted in the nursery. You can tell the depth in the nursery by a slight color change on the stem. Make sure the hole is big enough to allow the roots to be spread out. Roots should be pointing straight down in the hole and not "J" rooted (roots bent back pointing towards the top of the hole). For more information about planting bareroot tree and shrub seedlings, contact the South Carolina Forestry Commission or the National Wild Turkey Federation's Project HELP (Habitat Enhancement Land Program) (800) 843-6983.

Maintenance and Management

Maintenance and management requirements of plantings are important considerations when choosing a wildlife food. Some plant species are easily maintained, while others require a greater degree of care. Perennial and reseeding plant varieties usually involve the least amount of effort. In addition, plants that readily respond to disturbances (disking, mowing, burning) such as partridge pea, clovers, and other reseeding legumes, usually require the least amount of time and effort to establish and maintain.

Costs and Availability

Establishing wildlife plantings can become expensive in a hurry. As a first step you should decide how much you are willing (or can afford) to spend on food plots. Then you should develop a food plot budget. The cost of establishing food plots depends on several factors, but generally runs between \$60 to \$200 per acre. Maintenance costs also vary, but will range from \$15 to \$45 per acre each year.

The intensity of maintenance and management will affect the long term cost of food plots. For example, some plant species require little or no maintenance while others require more time, effort and expense. Generally speaking, perennial and reseeding plant varieties, like many clovers, usually require the least amount of maintenance since they don't have to be reestablished each year like annuals. In addition, some wildlife plants are more tolerant to fluctuations in temperature and rainfall. To determine the degree of care required for the plant(s) chosen for food plots, consult the management description found in wildlife planting guides.

To cut costs, compare prices of several plant varieties, fertilizers and lime. Usually the more common plant varieties are the least expensive. Unless financial constraints are not a concern, plant varieties costing over \$3 per pound should be avoided unless they are exceptional with well-documented results. Compare prices among several vendors to obtain the best value. Dealers who sell in bulk tend to have more competitive prices. If you choose varieties that are not readily available, plan several months in advance before planting to allow time to locate, order and receive seeds or seedlings.

Weed and Insect Control

Weed and insect control are not major concerns in wildlife food plots as they are for production agriculture. However, in severe infestations, weed and insect problems can cause a wildlife planting to fail. Herbicides may be necessary in some cases to control undesirable weeds, which have little or no value to wildlife. Herbicides are usually applied either before planting, during planting, or after plant emergence. Herbicide labels should be read and carefully followed to insure applicator safety and prevent unwanted damage to wildlife plants.

Insect damage is most harmful to wildlife plantings during the early stages of growth. Well-established plantings usually have more resistance to insects due to better-developed root systems. Effective insect control requires identifying the insect pest and applying a proper insecticide according to label instructions. For help in identifying invading insect pests and advice for pesticides to control infestations, contact your local county Extension agent.

Depredation by Domestic Animals and Other Wildlife

Wildlife food plots will also attract domestic animals and non-target wildlife species, wildlife that you are trying not to attract or benefit. Cattle, goats and swine can easily destroy a wildlife food plot in a matter of a few days. Domestic animals should be fenced out of wildlife plantings. In some situations, non-target wildlife will also become a nuisance and severely damage food plots. For example, in areas where deer densities are high, dove and quail food plots can be completely destroyed by deer browsing. This is especially true for plants like sunflower, peas, and some species of shrub lespedeza. Chufa plots planted for turkeys can also be damaged heavily by raccoons and wild hogs. Options to alleviate unwanted damage to food plots include reducing numbers of offending animals, establishing food plots with

plants that are less preferred by non-target wildlife, protecting food plots with electric fences, or a combination of all of the above.

Tree and shrub seedlings that have just come out of a nursery are likely to experience animal damage since they have been heavily fertilized in nurseries. This makes them extremely palatable to browsing animals. Browsing by white-tailed deer and other animals can be a serious threat to the survival of newly-planted tree and shrub seedlings. Rabbits and other small rodents can also browse and girdle seedlings. Deer can inflict additional damage to seedlings when antlers are rubbed on the main stem during the rut.

Tree shelters can be used to protect valuable seedlings from browsing animals and dramatically enhance seedling growth and survival. Tree shelters are long, tubular sleeves made of polyethylene or polypropylene that are placed around seedlings for the first three to five years after planting. For more information about tree shelters and their role in protecting tree and shrub seedlings, contact the South Carolina Forestry Commission or the National Wildlife Turkey Federation (NWTf). Tree shelters can be purchased from the NWTf's Project HELP (Habitat Enhancement Land Program) by calling (800) 843-6983.

Record Keeping

Many land managers don't bother keeping records on their food plots. Records can be invaluable over time in avoiding past mistakes and in determining the most effective planting strategy on your land. Records should be kept for each food plot and should generally include:

- Location and identity (number or name) of food plots,
- Variety of plant(s),
- Seedbed preparation technique,
- Planting dates (day/month/year),
- Seeding rate,
- Information from soil test results,

Checklist of Potential Food Plot Problems		
Sometimes under what seem to be ideal conditions a wildlife food plot will fail. When a wildlife planting does fail, it's important to find out why to minimize the chance of the same thing happening in the future. The following checklist may help identify why a wildlife planting failed.		
Problems and Possible Causes		
Seeds did not germinate?	Seed germinated but did not come up?	Seedling came up but did not survive?
<ul style="list-style-type: none"> soil type not suitable dry seedbed nonviable seed hard or dormant seed temperature extremes herbicide residue waterlogged soil too much or too little rain 	<ul style="list-style-type: none"> planted too deep through the soil soil crusted at surface poor seedling vigor insects or diseases temperature extremes 	<ul style="list-style-type: none"> soil too acidic or low fertility insects and diseases drought or flooding weed competition no legume inoculation winter kill browsed too early plants pulled up hard subsoil layer

- Type and rate of fertilization and liming,
- Planting method,
- Maintenance and management activities,
- Rainfall and temperature during establishment and growing season,
- Use by wildlife,
- Cost of establishment and maintenance, and
- Success of food plots.

Wildlife Food Plot Activity Record Sheets

Wildlife food plot activity record sheets provide a detailed account of food plot establishment, maintenance, and success. Record sheets should be 8½ x 11" and punched to fit into a three-ringed looseleaf management plan notebook. On the following page is an example wildlife food plot activity record sheet that can be modified to suit a landowner's/manager's specific needs.

Wildlife Food Plot Activity Record

1. Plant(s) Grown: _____ **Number of Acres:** _____ **Year:** _____ **Field Number/Name:** _____
 Variety(ies) _____ Seed dealer _____
 Seed: Germination % _____ Vigor test _____
 Seeder type and setting _____ Seeding rate _____
 Planting date(s) _____ Depth _____

2. Field History:
 Previous plant(s) _____ Planting date _____
 Variety(ies) _____ Seeding rate _____
 Last year's use by wildlife _____

3. Soil and Site Preparation Information:
 Soil type _____ Tillage Method _____
 Describe tillage method(s) _____ Date _____
 Other comments on soil and site preparation: _____

4. Soil Test Results and Recommendations:

<u>Soil Lab Analysis</u>					<u>Recommendations</u>				
Field Identification	pH	P	K	Other	Lime tons/A	Pounds / Acre			
						N	P ₂ O ₅	K ₂ O	Other
Date soil samples were taken _____									

5. Fertilizer and Liming Practices: (pounds applied per acre)

Method	Timing	N	P ₂ O ₅	K ₂ O	Other Nutrients
Broadcast	Pre plant	_____			
Topdress	Post plant	1	_____		
		2	_____		
Type of lime _____		Year Applied _____		Rate _____	
Herbicide used _____		Date Applied _____		Rate _____	

6. Costs

Soil test(s) \$ _____	Seed(s) \$ _____	Fertilizer \$ _____
Lime \$ _____	Inoculant \$ _____	Herbicide \$ _____
Labor \$ _____	Machinery \$ _____	Other \$ _____

7. Management Activities:

8. Success of Planting:

Field Appearance					<u>Use by Wildlife</u>		
Observation Date	Poor	Fair	Good	Excellent	Low	Medium	High
_____					_____	_____	_____
_____					_____	_____	_____
_____					_____	_____	_____

9. Other Notes or Observations:

